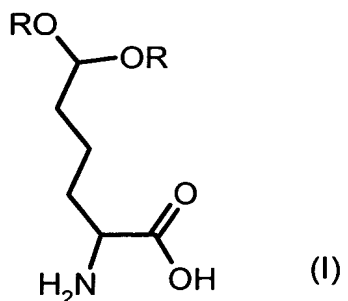


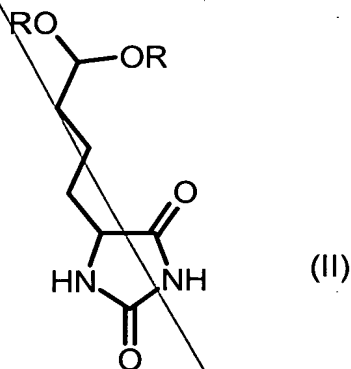
Patent claims:

1. A process for the preparation of allysine acetal of the general formula (I):



comprising:

contacting a hydantoin of the general formula (II):



wherein in formulae (I) and (II) R represents (C₁-C₈)-alkyl, (C₂-C₄)-alkylene, (C₆-C₁₈)-aryl, (C₇-C₁₉)-aralkyl, or (C₁-C₈)-acyl,

with a hydantoinase and a D- or L-specific carbamoylase,

under conditions suitable for *in situ* racemisation of the hydantoin or of an N-carbamoyl amino acid.

Sub
A2

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- Sub A2
- 5 2. The process of Claim 1, wherein the hydantoinase, a D- or L-specific carbamoylase, or an enzyme used in racemization is used in free form, in immobilized form, as a cell fraction or extract, or in a form enclosed in a cell.
3. The process of Claim 1, wherein the *in situ* racemization is spontaneous, enzyme-catalysed, or both.
- 10 Sub A3
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20 4. The process according to Claim 1, wherein a total cell catalyst is used, and wherein said total cell catalyst is obtained from a cell that comprises a cloned gene coding for a hydantoin racemase, a hydantoinase and an L- or D-specific carbamoylase.
5. The process according to Claim 4, wherein said total cell catalyst comprises an L-specific carbamoylase.
6. The process according to Claim 4, wherein the total cell catalyst is a recombinant bacterium.
7. The process according to Claim 6, wherein said recombinant bacterium is *E. coli*.
- Sub A4
- 25 8. The process according to Claim 1 wherein the reactions are carried out in an enzyme-membrane reactor.
9. The process according to Claim 1, wherein the reactions are carried out sequentially or continuously.
- Sub A5
- 30 10. The process according to Claim 1, further comprising a metal salt.
11. A method for producing a pharmaceutical or a biologically active product using an acetal produced by the process of Claim 1.
- add A6